

CLAIMS

1. Influenza antigen, comprising a fusion product of at least the extracellular part of a conserved influenza membrane protein or a functional fragment thereof and a presenting carrier.
2. Influenza antigen, wherein the presenting carrier is a presenting (poly)peptide.
3. Influenza antigen, wherein the presenting carrier is a non-peptidic structure, such as glycans, peptide mimetics, synthetic polymers.
4. Influenza antigen as claimed in claims 1-3 further comprising an additional domain for enhancing the cellular immune response immunogenicity of the antigen.
5. Influenza antigen as claimed in claims 1-4, wherein the conserved influenza membrane protein is the M2 membrane protein.
6. Influenza antigen as claimed in claim 5, wherein the M2 membrane protein originates from influenza A virus.
7. Influenza antigen as claimed in claims 1-6, wherein the presenting (poly)peptide is selected from the hepatitis B core protein, one or more C3d domains, tetanus toxin fragment C.
8. Influenza antigen as claimed in claims 1-7, wherein the antigen consists of Lactococci cells expressing the fusion product in or on their cell membrane, optionally said cells release said product.
9. Influenza antigen as claimed in claims 1-8, wherein the functional fragment of the conserved influenza membrane protein is a fragment that is capable of eliciting a statistically significant higher immunoprotection when administered in an immunoprotective dose to test members of a species than is found in control members of the same species not receiving the functional fragment.

add 1a3
add B5
add C5

000000-000000

10. Influenza antigen as claimed in claims 1-9, wherein the additional domain is an influenza specific T helper cell epitope or cytotoxic T cell epitope.

11. Influenza antigen as claimed in claims 1-
5 10, obtainable by preparing a gene construct comprising a
coding sequence for at least the extracellular part of a
conserved influenza membrane protein or a functional
fragment thereof and at least one coding sequence for a
presenting (poly)peptide operably linked thereto,
10 optionally in the presence of suitable transcription
and/or translation regulatory sequences, bringing this
gene construct in a suitable acceptor cell, effecting
expression of the gene construct in the acceptor cell and
optionally isolating the antigen from the acceptor cell
15 or its culture medium.

12. Influenza antigen as claimed in claim 11, wherein the coding sequence for the extracellular part of a conserved influenza membrane protein consists of a coding sequence for the extracellular part of the M2 protein of the influenza A virus or a functional fragment thereof and the coding sequence for the presenting (poly)peptide is selected from coding sequences for hepatitis B core protein, one or more C3d domains, or tetanus toxin fragment C.

25 13. Influenza antigen as claimed in claims 1-
12, comprising the amino acids 2 to 24 of the M2 protein
of influenza A virus, or modified versions thereof not
substantially altering the tertiary structure of this
part of the protein and hepatitis B core protein and/or
30 one or more C3d domains.

14. Influenza antigen as claimed in claims 1-13
for use in the preparation of a vaccine against influenza
for humans and animals.

15. Influenza antigen as claimed in claims 1-14
35 for use in the preparation of a vaccine against influenza
A for humans and animals.

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99																																																																																																																																																												
0	00000000	00000001	00000010	00000011	00000100	00000101	00000110	00000111	00001000	00001001	00001010	00001011	00001100	00001101	00001110	00001111	00010000	00010001	00010010	00010011	00010100	00010101	00010110	00010111	00011000	00011001	00011010	00011011	00011100	00011101	00011110	00011111	00100000	00100001	00100010	00100011	00100100	00100101	00100110	00100111	00101000	00101001	00101010	00101011	00101100	00101101	00101110	00101111	00110000	00110001	00110010	00110011	00110100	00110101	00110110	00110111	00111000	00111001	00111010	00111011	00111100	00111101	00111110	00111111	01000000	01000001	01000010	01000011	01000100	01000101	01000110	01000111	01001000	01001001	01001010	01001011	01001100	01001101	01001110	01001111	01010000	01010001	01010010	01010011	01010100	01010101	01010110	01010111	01011000	01011001	01011010	01011011	01011100	01011101	01011110	01011111	01100000	01100001	01100010	01100011	01100100	01100101	01100110	01100111	01101000	01101001	01101010	01101011	01101100	01101101	01101110	01101111	01110000	01110001	01110010	01110011	01110100	01110101	01110110	01110111	01111000	01111001	01111010	01111011	01111100	01111101	01111110	01111111	10000000	10000001	10000010	10000011	10000100	10000101	10000110	10000111	10001000	10001001	10001010	10001011	10001100	10001101	10001110	10001111	10010000	10010001	10010010	10010011	10010100	10010101	10010110	10010111	10011000	10011001	10011010	10011011	10011100	10011101	10011110	10011111	10100000	10100001	10100010	10100011	10100100	10100101	10100110	10100111	10101000	10101001	10101010	10101011	10101100	10101101	10101110	10101111	10110000	10110001	10110010	10110011	10110100	10110101	10110110	10110111	10111000	10111001	10111010	10111011	10111100	10111101	10111110	10111111	11000000	11000001	11000010	11000011	11000100	11000101	11000110	11000111	11001000	11001001	11001010	11001011	11001100	11001101	11001110	11001111	11010000	11010001	11010010	11010011	11010100	11010101	11010110	11010111	11011000	11011001	11011010	11011011	11011100	11011101	11011110	11011111	11100000	11100001	11100010	11100011	11100100	11100101	11100110	11100111	11101000	11101001	11101010	11101011	11101100	11101101	11101110	11101111	11110000	11110001	11110010	11110011	11110100	11110101	11110110	11110111	11111000	11111001	11111010	11111011	11111100	11111101	11111110	11111111

16. Vaccine against influenza, comprising at least an antigen as claimed in claims 1-15, optionally in the presence of one or more excipients.

17. Vaccine as claimed in claim 16, wherein the antigen is in isolated form.

18. Vaccine as claimed in claim 16, wherein the antigen is part of a membrane fragment.

19. Vaccine as claimed in claim 16, wherein the antigen is anchored in the membrane of an acceptor cell expressing the antigen.

20. Vaccine as claimed in claim 16, wherein the antigen consists of Lactococci cells expressing the fusion product in or on their cell envelope.

21. Vaccine as claimed in claims 16-20, further comprising one or more other influenza antigens, for example selected from hemagglutinin, neuraminidase nucleoprotein and/or native M2.

22. Use of an antigen as claimed in claims 1-13 for the preparation of a vaccine against influenza.

23. Method of preparing an antigen as claimed in claims 1-15, comprising the steps of:

a) preparing a gene construct comprising a coding sequence for at least the extracellular part of a conserved influenza membrane protein or a functional fragment thereof and at least one coding sequence for a presenting (poly)peptide operably linked thereto, optionally in the presence of suitable transcription and/or translation regulatory sequences,

b) bringing this gene construct in a suitable acceptor cell,

c) effecting expression of the gene construct in the acceptor cell, and

d) optionally isolating the antigen from the acceptor cell or its culture medium.

24. Acceptor cell, expressing an antigen as claimed in claims 1-15.

25. Acceptor cell as claimed in claim 24, wherein the cells are Lactococcus cells.